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EXAMINER

AKHAVANNIK, HUSSEIN

ART UNIT PAPER NUMBER

2621

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/784,112

Applicant(s)

TAKEO, HIDEYA

Examiner

Hussein Akhavannik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-17 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. The amendments to the specification overcome the Examiner's objections cited in paragraph 1 of the previous office action (now Paper No. 4).

Response to Arguments

2. Applicant's arguments filed January 5, 2004 have been fully considered but they are not persuasive.

The Applicant alleges that Ito et al teaches "displaying the characteristic value C_2 along with the visible X-ray image, without making any judgment, or identification, as to whether the tumor is benign or malignant." The Examiner agrees that in column 13, lines 13-22, Ito et al do make such an assertion. The Applicant then alleges that Ito et al do not teach "displaying one or more standard parameters with information including at least the information identifying the suspected anomalous shadow ...". The Examiner respectfully disagrees. Ito et al must first determine if a shadow is present in order to determine a characteristic value for that shadow, as explained in column 7, lines 11-20 and illustrated in figure 4 by the shadow extraction means (40c). All of the shadows detected by Ito et al are suspected anomalous shadows, as parameters extracted from all of the shadows are analyzed in order to determine if each shadow is anomalous (corresponding to the value C_2). Ito et al then explain that the position of the center of the shadows are extracted in column 9, lines 22-31. This position information is used in conjunction with the characteristic value C_2 in the display, so that the characteristic value and the shadow location correspond to each other. Therefore, the position information corresponds to the "information identifying the detected suspected anomalous shadow", as the position of each detected anomalous shadow is determined by Ito et al to identify the shadow. Ito et al explain

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determining a certainty of detection, C_2 , in column 10, line 45 to column 11, line 12. The certainty of detection corresponds to the “one of more standard parameters is a parameter used for distinguishing the suspected anomalous shadow from a normal shadow.” Ito et al explain in column 13, lines 13-22 that this value is displayed along with the shadows, as addressed above. Therefore, Ito et al clearly explain outputting one or more standard parameters concerning the suspected anomalous shadow used for distinguishing the suspected anomalous shadow from a normal shadow (corresponding to the value C_2) together with information identifying the suspected anomalous shadow (center position of each shadow).

The Applicant alleges that Ito et al fail to teach or suggest the image output means further outputting value(s) of one or more standard parameters and the certainty of detection of the suspected anomalous shadow. The Examiner agrees that the system of Ito et al only displays the certainty of detection for each suspected anomalous shadow, thereby only displaying one standard parameter. However, claims 3, 7, and 13, no more require a second parameter than the standard parameter in claim 1. Claims 1, 3, 7, and 13 similarly recite “the image output means further outputs” that points to the “image output means for outputting information including at least information identifying the detected suspected anomalous shadow ...” in claim 1. Therefore, claims 3, 7, and 13 do not require that “the image output means further outputs value(s) of one or more standard parameters concerning the suspected anomalous shadow together with the information including at least the information identifying the suspected anomalous shadow ...” as recited in claim 1. Therefore, the characteristic value C_2 does correspond either to the standard parameter recited in claim 1 or the certainty of detection recited in claims 3, 7, and 13, by being further output by the image output means.

Claim Objections

3. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 10 is a replica of claim 2, and therefore does not further limit claim 1.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 and 10-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al (U.S. Patent No. 5,224,036).

Referring to claim 1,

i. Anomalous shadow detecting means for detecting a suspected anomalous shadow from image data descriptive of an inputted image according to a prescribed detection process is illustrated by Ito et al in figure 4 by the shadow extraction means (40c). Ito et al explain that judgement is made as to whether the extracted shadow is a tumor (anomalous) in column 8, lines 58-63.

ii. Image output means for outputting information including at least information identifying the detected suspected anomalous shadow is illustrated by Ito et al in figure 4 by the display means (40h). In order to be able to point out the anomalous shadows, the

system of Ito et al determines the center of the shadows as explained in column 9, lines 22-31. Ito et al explain in column 11, lines 13-19 that the shadows of the malignant tumors are pointed out on the display, in company with the image signal.

iii. The image output means further outputting values of one or more standard parameters concerning the suspected anomalous shadow together with the information including at least the information identifying the suspected anomalous shadow, wherein each of the one or more standard parameters is a parameter used for distinguishing the suspected anomalous shadow from a normal shadow is explained by Ito et al in column 13, lines 13-22. The information identifying the suspected anomalous shadows (position information) is output on the display by Ito et al, corresponding to claim 1ii. Ito et al further explain displaying the probability that a suspected shadow is malignant so that a user can manually determine if a shadow is benign or malignant, corresponding to the one or more standard parameters concerning the suspected anomalous shadow.

Referring to claims 2 and 10, the image output means being either an image display means or printing means is explained by Ito et al in column 11, lines 13-19 as the CRT display.

Referring to claim 3, the image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow is explained by Ito et al in column 13, lines 13-22. The characteristic value C_2 is explained to be the probability that a shadow is a shadow of a malignant tumor, which corresponds to the certainty of detection of the suspected anomalous shadow. This information is displayed in conjunction with the information identifying the suspected anomalous shadow, corresponding to claim 1ii. Claims 3, 7, and 13 similarly recite

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“the image output means further outputs” that points to the “image output means for outputting information including at least information identifying the detected suspected anomalous shadow ...” in parent claim 1. Therefore, claims 3, 7, and 13 do not require that “the image output means further outputs value(s) of one or more standard parameters concerning the suspected anomalous shadow together with the information including at least the information identifying the suspected anomalous shadow ...” as recited in claim 1. Therefore, the characteristic value C_2 does correspond either to the standard parameter recited in claim 1 or the certainty of detection recited in claims 3, 7, and 13, by being further output by the image output means.

Referring to claim 4, this claim corresponds to claim 2.

Referring to claim 5, one or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow is explained by Ito et al in column 13, lines 13-22. The standard parameter is explained to be the probability that a shadow is a shadow of a malignant tumor, which corresponds to the malignancy/benignancy of a suspected anomalous shadow.

Referring to claim 6, this claim corresponds to claim 2.

Referring to claim 7,

- i. One or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow corresponds to claim 5.

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- ii. The image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow corresponds to claim 3.

Referring to claim 8, this claim corresponds to claim 2.

Referring to claim 11, one or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow corresponds to claim 5.

Referring to claim 12, this claim corresponds to claim 2.

Referring to claim 13,

- i. One or more standard parameters including at least one of calcification density, image density concentration of the suspected anomalous shadow, an output value of an iris filter, and malignancy/benignancy of the suspected anomalous shadow corresponds to claim 5.

- ii. The image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow corresponds to claim 3.

Referring to claim 14, this claim corresponds to claim 2.

Referring to claim 15,

- i. An anomalous shadow detecting means for detecting a suspected anomalous shadow from image data descriptive of an inputted image according to a prescribed detection process corresponds to claim 1i.

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ii. An image output means for outputting information including at least information identifying the detected suspected anomalous shadow corresponds to claim 1ii.

iii. The image output means further outputting certainty of detection of the suspected anomalous shadow together with the information including the information identifying the suspected anomalous shadow corresponds to claim 3.

Referring to claim 16, this claim corresponds to claim 2.

Referring to claim 17, the information identifying the suspected anomalous shadow is either of an image of the suspected anomalous shadow or numerical data descriptive of a position, morphology or size of the suspected anomalous shadow is explained by Ito et al in column 11, lines 13-19. Ito et al explain reproducing a visible image of the malignant (anomalous) shadows on a display, corresponding to an image of the suspected anomalous shadow.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wang (U.S. Patent No. 6,266,435) – To exhibit displaying the probability of abnormal detection on a display for only the thresholded shadow detections, as illustrated in figure 1 and explained in column 8, line 14 to column 9, lines 7.

Murthy et al (U.S. Patent No. 6,320,976) – To exhibit displaying multiple parameters for shadow detections, including a saliency score, to a user as explained in column 7, lines 11-20.

Giger et al (U.S. Patent No. 5,832,103) – To exhibit outputting the likelihood of malignancy as illustrated in figure 1.

Kallergi et al (U.S. Patent No. 6,630,937) – To exhibit displaying multiple parameters of a shadow in figure 4 and displaying the likelihood of malignancy as explained in column 6, lines 32-41.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein Akhavannik whose telephone number is (703)306-4049. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H. Boudreau can be reached on (703)305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hussein Akhavannik
February 24, 2004

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